

MATTER

Matter =

- Substances that make up the universe
- Two properties of matter are that
 1. It takes up space (has volume)
 2. It has mass
- Volume is measured in
 - Milliliters (mL) and liters (L)
 - Cubic centimeters (cm³) and cubic meters (m³)
- Mass is measured in
 - Grams (g)
 - Kilograms (kg)

3 states of matter

- **Solid** =
 - Substance has definite shape and volume
 - Particles are closely packed
- **Liquid** =
 - Substance has definite volume but no definite shape
 - Particles have more kinetic energy than solid
- **Gas** =
 - Substance has no definite shape or volume
 - Particles have more kinetic energy than liquid

MASS and VOLUME

*Remember, all matter has **mass** and **volume**

Mass =

- Measure of the amount of matter in an object
- Measured using a balance
- NOT WEIGHT!
 - Weight measures the force of gravity
 - Weight changes on different planets but mass stays the same!

Volume =

- Measure of space taken up by matter
- $1 \text{ mL} = 1 \text{ cm}^3$
- Measured using
 - Graduated cylinder (liquids)
 - Exterior dimensions (solids)
 - Volume of a block =
length x width x height
 - Sample Calculations
L = 2cm, W = 4cm, H = 6cm
V = 48 cm^3
L = 3cm, W = 5cm, H = 7cm
V = 105 cm^3

Calculate the volume of blocks with the following dimensions

#		Length (cm)	Width (cm)	Height (cm)	Show Work Here	Volume (cm ³)
1		2	3	4		
2		1	5	7		
3		6	1	8		
4		5	2	9		
5		11	3	2		

DENSITY

Density =

- Mass per unit volume of a substance
- Density = Mass / Volume
- Measured in g/cm^3
- Density is a **characteristic property**
 - An attribute that can be used to help identify a substance
 - Not affected by amount or shape of substance
 - The iron in a bolt and the iron in the hull of a ship have the same density
 - Other characteristic properties of matter include melting, freezing, and boiling points